Space Weather Forecast

Issued on Wednesday, 17 August 2022 at 00:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: G1/Minor storm likely Days 1 and 2 (17-18 Aug), chance of G2/Moderate storm. Further Moderate flares (R1-R2 Radio blackouts) likely throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate with two Moderate-class flares in the last 24 hours. These were from a relatively complex region in the southwest quadrant. There are currently ten sunspot regions on the visible disc. The region mentioned above is the largest and most active region and is displaying strong spots with magnetic complexity. The next largest region is near north centre disc, but has been relatively stable. A further region near the most active region has grown in recent hours. Three regions are approaching the west limb, with another couple of weak regions becoming visible in the southeast. Most other regions appear largely small and stable for now.

There are two main CMEs (Coronal Mass Ejections) which left the Sun between the 14th and 16th that have potential to reach Earth on 17th and 18th. The large flare earlier on 16th did produce a CME, but this appears likely to mostly pass below Earth. The most recent Moderate-class flare may also have produced a CME but we await imagery to assess this.

Solar Wind / Geomagnetic Activity: The solar wind has shown a decline to slow-ambient levels. Wind speeds declined from around 420km/s to vary between 350-380 km/s. The Interplanetary Magnetic Field was weak throughout although with a recent increase, with the north-south component varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate with a slight chance of High levels. The most likely source region for any larger flares would be from the larger magnetically complex region which is now in the southwest quadrant.

Solar Wind / Geomagnetic Activity: There are two main CME arrivals likely during this period. The first left the Sun on 14 August and is likely to arrive around 17/0600 UTC, +/-12 hours. A second CME left the Sun on 16 August and may give a glancing blow at Earth either late on 18 or early on 19 August. Solar winds are currently at slow-ambient levels. Later on Day 1 (17 Aug) Earth is expected to connect with the fast wind from a coronal hole, although this is likely to combine with the aforementioned first CME. Wind speeds are likely to reach elevated levels at around 500-600km/s. Solar winds are expected to remain enhanced through much of this period before perhaps declining somewhat through Day 4 (20 Aug).

Geomagnetic activity is expected to be mainly Quiet at first. During Day 1, activity is expected to become Active to G1/Minor Storm, with a chance of G2/Moderate Storm and a slight chance of G3/Strong Storms, most likely when the first CME mentioned above affects Earth. A gradual decline in activity is expected through Day 4.

Energetic Particles / Solar Radiation: Solar radiation storms are unlikely, but there is a slight chance of an S1 or greater event. This is mainly due to the more complex region which is now in the western hemisphere of the Sun, where any proton events are more likely to reach Earth.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	50	40	5
Strong	G3	No	20	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	50
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	15	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.